Comparison of Cosmetic Outcome Between Single-Incision Laparoscopic Cholecystectomy and Conventional Laparoscopic Cholecystectomy: An Objective Study

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Abstract

Background: Single-incision laparoscopic cholecystectomy (SILC) has been projected to have better cosmetic outcome compared with conventional laparoscopic cholecystectomy (CLC). However, there are scarce data that have objectively compared the patient’s perception of cosmetic outcome after SILC and CLC.

Methods: The SILC and CLC patients, who were operated in the last 2 years, were personally interviewed and assessed using the Patient Scar Assessment Questionnaire. A lower score indicated a better patient outcome. The satisfaction with the appearance and the symptoms due to the scars was assessed in all the patients.

Results: Fifty-two patients were included in the study (25 SILC, 27 CLC). The age and sex distributions and body mass indexes were similar in both groups. The scores of different parameters assessed as per Patient Scar Assessment Questionnaire—appearance (SILC, 1.08–0.4; CLC, 1.14–0.5; \( P = .57 \)), symptoms (SILC, 1.16–0.5; CLC, 1.18–0.4; \( P = .83 \)), scar consciousness (SILC, 1.04±0.2; CLC, 1.07±0.3; \( P = .6 \)), satisfaction with symptoms (SILC, 1.12±0.3; CLC, 1.18±0.4; \( P = .52 \)), and satisfaction with appearance (SILC, 1.04±0.2; CLC, 1.11±0.3; \( P = .34 \))—were similar in both groups. The overall satisfaction scores were also statistically similar in both groups (SILC, 5.44±1.4; CLC, 5.70±1.7; \( P = .54 \)). Overall, a majority of patients (>80%) in both groups gave the lowest score (1), indicating maximum satisfaction, in all the categories.

Conclusions: Patient perception regarding cosmetic outcome after SILC and CLC was similar in both groups. SILC does not seem to offer any significant cosmetic advantage over CLC. This point needs to be assessed in detail by larger studies, as cosmetic benefit is projected as one of the major advantages of single-incision surgery.

Introduction

The advancement in surgical techniques has revolved around increasing success rate, decreasing morbidity, minimizing pain, and improving cosmetic results of the surgical procedures. The development of single-incision laparoscopic surgery has been primarily based on improving cosmesis1–3 and, perhaps, decreasing postoperative pain as well.4 Although few published studies have reported better cosmetic outcome studies for single-incision laparoscopic cholecystectomy (SILC) compared with the conventional laparoscopic cholecystectomy (CLC),1–3 as yet there is no study as per our literature search that has compared the cosmetic outcome between SILC and CLC objectively. In this study, we evaluated the cosmetic outcome between SILC and CLC using validated scar assessment scores.5

Subjects and Methods

The patients operated in the last 2 years in a single hospital were included in the study. Each of them was interviewed personally or by telephone, and the Patient Scar Assessment Questionnaire was filled out individually. To maintain accuracy and consistency, no postal questionnaires were sent, and the same resident interviewed all the patients. The ethical committee of the institution gave approval to conduct the study.

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The CLC was performed in the standard manner, with two 10-mm ports in the umbilical and epigastric regions and the two 5-mm ports in the right hypochondrium and right lumbar regions. All the skin incisions were closed with 3-0 nylon suture.

The SILC was done by everting the umbilicus after applying two Allis forceps on either side of the umbilicus. A vertical 2.50–2.75-cm incision was placed between the two Allis forceps. The Allis forceps were then used to hold the edges of the incision, and subcutaneous space was created by using scissors both superiorly and inferiorly. A Veeres needle was introduced to create the pneumoperitoneum. After adequate pneumoperitoneum was achieved, a 10-mm trocar was introduced from the inferior part of the wound, and two 5-mm trocars were then inserted on each side of the superior part of the wound under direct vision. The traction sutures were taken through the fundus of the gallbladder and Hartmann’s pouch. The surgery was completed using conventional straight instruments. The skin was closed with No. 1 Vicryl (polyglactin), taking the subdermal edges of the skin from the center of the incision to invert the umbilicus and obliterate the dead space. The skin was closed with interrupted 3-0 nylon suture.

The patient scar questionnaire was divided into the following five categories (with possible scores in parentheses): appearance (1–5), symptoms (1–5), scar consciousness (1–4), satisfaction with appearance (1–4), and satisfaction with symptoms (1–4). Each category question could have five or four possible responses (the first two questions had five and the next three questions could have four possible responses). A lower score indicates a favorable cosmetic outcome.

**Statistical analysis**

Categorical outcomes were analyzed with Fisher’s exact test or chi-square test. Continuous outcomes were analyzed with Student’s t test or analysis of variance, wherever required. All analyses were made using SPSS (Chicago, IL) version 11.5. No interim analyses were performed.

**Results**

Fifty-two patients were included in the study (25 SILC, 27 CLC). The age, sex distribution and body mass index were similar in both the groups (Table 1). The mean scores of different parameters assessed as per Patient Scar Assessment Questionnaire—appearance (SILC, 1.08±0.4; CLC, 1.14±0.5; \( P=0.57 \) [not significant]), symptoms (SILC, 1.16±0.5; CLC, 1.18±0.4; \( P=0.83 \) [not significant]), scar consciousness (SILC, 1.04±0.2; CLC, 1.07±0.3; \( P=0.6 \) [not significant]), satisfaction with symptoms (SILC, 1.12±0.3; CLC, 1.18±0.4; \( P=0.52 \) [not significant]), and satisfaction with appearance (SILC, 1.04±0.2; CLC, 1.11±0.3; \( P=0.34 \) [not significant])—were similar in both groups (Table 2). The overall satisfaction scores were also statistically similar in both groups (SILC, 5.44±1.4; CLC, 5.70±1.7; \( P=0.54 \) [not significant]). The majority of patients in both groups had a high level of satisfaction, as more than 80% of patients in both groups gave the minimum score (1), indicating maximum satisfaction, in all the categories (Table 3).

**Discussion**

The better cosmetic results\(^1\)–\(^3\) and decreased morbidity, primarily postoperative pain,\(^4\) are projected to be the benefits of SILC over CLC. However, no study so far has objectively compared the cosmetic benefits between the two procedures. The present study demonstrated that patients’ perceptions about various parameters of cosmesis of the scar—namely, appearance of the scar, trouble with the symptoms of the scar, self-consciousness about the scar, satisfaction with the appearance of the scar, and satisfaction with the amount of trouble from the symptoms of the scar—were not statistically different between the SILC and CLC groups. The overall satisfaction scores were also similar in both groups. This finding is significant because cosmetic benefits are one of the major projected advantages of SILC over CLC. If this is not so, then the case in favor of SILC would not remain that strong considering the complexity associated with SILC—namely, technical difficulty,\(^5\)–\(^8\) higher risk of complications,\(^9,10\) especially in patients with a body mass index of >33 kg/m\(^2\),\(^11\) increased operating time,\(^2,6,7,10,12–14\) need for sophisticated instruments,\(^8\) no improvement in postoperative pain scores compared with CLC,\(^12,13–15\) and lack of long-term data. Even regarding cosmesis, although few studies have found SILC to have a better cosmetic outcome,\(^10\) other studies found no difference in cosmetic outcome,\(^11\) satisfaction scores,\(^7\) and quality of life\(^10\) between the two groups. Ma et al.,\(^10\) in a well-conducted randomized

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<th>Table 1. Patient Parameters</th>
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<tr>
<td><strong>SILC</strong> (n=25)</td>
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<tr>
<td>Age (years) 44.2±13.9</td>
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<td>Sex 20/5</td>
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<td>Follow-up (days) (median) 320 (304)</td>
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<td>BMI (kg/m(^2)) 25.1±4.1</td>
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BMI, body mass index; CLC, conventional laparoscopic cholecystectomy; NS, not significant; SILC, single-incision laparoscopic cholecystectomy.

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<th>Table 2. Mean Scores in Each Category as Per the Patient Scar Assessment Questionnaire</th>
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<td><strong>SILC</strong> (n=25)</td>
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<tr>
<td>Appearance (1–5) 1.08±0.4</td>
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<tr>
<td>Symptoms (1–5) 1.16±0.5</td>
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<tr>
<td>Scar consciousness (1–4) 1.04±0.2</td>
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<tr>
<td>Satisfaction with symptoms (1–4) 1.12±0.3</td>
</tr>
<tr>
<td>Satisfaction with appearance (1–4) 1.04±0.2</td>
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<tr>
<td>Overall satisfaction score (related to scar) 5.44±1.4</td>
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The patient scar questionnaire is divided into five categories, with the range of possible scores in parentheses. Each category contains several questions with four or five possible responses, which are scored from 1 (best response) to 5 (worst response).

\(^a\)By Student’s t test.  
\(^b\)The overall satisfaction score is the total of all the five scores and ranges from 5 to 22 (5=best, 22=worst).
controlled trial, found that the single-incision laparoscopic surgery procedure incurred more complications without any significant benefits in patients’ overall and cosmetic satisfaction. In view of all this, the advantages of SILC over CLC need to be scrutinized in a large number of patients over a longer period of time.

However, there is a relevant point that needs to be discussed. The difference in cosmetic results would be more apparent if the CLC patients were shown the results of SILC incision laparoscopic surgery and then compared to the CLC scar. This conclusion needs to be verified by prospective randomized controlled trials in large numbers of patients.

Conclusions
The patient’s perception about the cosmetic results after CLC was excellent and comparable to that following SILC when compared independently by an objective method. SILC does not seem to offer any significant cosmetic advantage over CLC. This conclusion needs to be verified by prospective randomized controlled trials in large numbers of patients.

Disclosure Statement
No competing financial interests exist.

References


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Commentary on “Comparison of Cosmetic Outcome Between Single-Incision Laparoscopic Cholecystectomy and Conventional Laparoscopic Cholecystectomy: An Objective Study”

Patricio Varela, MD

The scientific method used by Garg et al.\textsuperscript{1} is quite rigorous, and therefore the results expressed are of great interest to surgeons. Regarding the conclusion that there were no significant differences when comparing the cosmetic results between single-incision laparoscopic cholecystectomy and conventional laparoscopic cholecystectomy, in my point of view this is not a surprising conclusion, considering that both procedures are minimum access, and therefore they share the benefits of minimally invasive procedures.

Reference